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TARGETING FOOD SELECTIVITY IN YOUNG CHILDREN IN A PRESCHOOL CLASSROOM USING A MULTI-COMPONENT TREATMENT PACKAGE

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THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
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By

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ABSTRACT OF THESIS

TARGETING FOOD SELECTIVITY IN YOUNG CHILDREN IN A PRESCHOOL CLASSROOM USING A MULTI-COMPONENT TREATMENT PACKAGE

The purpose of the study was to evaluate the effectiveness of using a video model, graduated exposure (i.e., touch, smell, try, eat), and positive reinforcement to first increase food exploration, and then increase consumption of non-preferred foods in young children that exhibit food selectivity in a school setting. A multiple probe design across behaviors replicated across participants was used to evaluate the effectiveness of a treatment package. The treatment package consisted of a video model of each target behavior (touch, smell, try, eat) and positive reinforcement which included preferred foods and materials. The results indicated that the treatment package was effective in increasing the food exploration and consumption of non-preferred foods for one participant, and was inconclusive for the second participant.

KEYWORDS: Food selectivity, classroom, video model, choice, food exploration

Christina C. Hesley

April 12, 2019

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Section 1: Introduction

Some researchers have conceptualized food selectivity as a form of noncompliance in which a child refuses to eat a sufficient variety of foods and ultimately escapes or avoids eating non-preferred foods (e.g., when presented with non-preferred foods, the child lays his head on a table or elopes from the table; Dawson, Piazza, Sevin, Gulotta, Lerman, & Kelly, 2003). Food selectivity can be specific to a food's texture, color, shape, presentation, type, brand, or container (Tanner & Andreone, 2015) and is often accompanied by challenging behaviors and rejection of food (Bandini, Anderson, & Must, 2010). For some individuals, inappropriate mealtime behavior is developed and maintained, at least in part, by environmental events and learning histories (Bachmeyer et al., 2009; Piazza et al., 2003). In the past, food selectivity was defined as food refusal behaviors leading to the inability to attain adequate nutritional health and often scored solely from parent report (Dovey & Martin 2012; Herndon, DiGuiseppi, Johnson, Leiferman, & Reynolds, 2009; Piazza et al., 2003; Williams, Dalrymple, & Neal, 2000). Bandini et al. (2010) put forth a new standard definition for food selectivity, including three domains: food refusal, limited food repertoire, and high-frequency single food intake. Food selectivity can lead to poor nutrition (e.g., hypoglycemia, low protein intake, vitamin deficiencies, and high caregiver stress; Kral, Eriksen, Souders, & Pinto-Martin, 2013; Levin & Carr, 2001; Postorino et al., 2015: Stough, Gillette, Roberts, Jorgensen, & Patton, 2015; Suarez, Atchison, & Lagerwey, 2014). In addition, selective food preferences may result in inadequate daily nutritional intake even though the child may maintain his or her weight by eating a sufficient quantity of preferred foods (Penrod, Gardella, & Fernand, 2012).

When introducing new foods to a child, a child may display resistance to adult supports to eat, noncompliance with directives to eat, or engage in multiple challenging behaviors to escape mealtime. Kern and Marder (1996) noted that many parents often resort to offering their child a preferred food to abate the negative behavior. Based on these experiences, parents of selective eaters may stop introducing new foods and provide their children with only preferred foods to avoid these negative mealtime behaviors (Penrod, Gardella, & Fernand, 2012). Although multiple studies on intervening on food selectivity in children with autism spectrum disorder (ASD) are published in the literature, food selectivity and related challenging behaviors are not unique to a specific population or disability status (Curtin et al., 2015). Prevalence rates of feeding problems in children with typical development are as high as 50% (Faith, 2013), while reports of young children with disabilities exhibiting maladaptive eating behaviors are even larger, with estimates as high as 90% (Ahearn, Castine, Nault, & Green, 2001, Mari-Bauset, Zazpe, Mari-Sanchis, Llopis-Gonzalez, & Morales-Suarez-Varela, 2013). Considering the behavioral and medical characteristics of different children, it is unclear to what extent food selectivity is a result of conditioned aversions, skill-based deficits, behavioral mismanagement, or other variables. Curtin and colleagues (2015) found that high levels of food refusal was associated with challenging behaviors during mealtime in both children with ASD and those with typical development, with no evidence of a differential effect. Although the etiology of feeding disorders varies across children, one commonality is that feeding problems often persist as a result of environmental factors (Penrod, Gardella, & Fernand 2012).

The majority of published studies on treating food selectivity have focused on negative reinforcement contingencies (e.g., non-removal of the spoon [NRS]) to promote food exploration and consumption, while fewer empirical studies have utilized alternative interventions to this approach (Cermak, Curin, & Bandini, 2010). The majority of the literature have implemented escape extinction in a clinic setting (e.g., NRS; Tanner & Andreone, 2015). NRS requires the participant to consume the target food prior to receiving reinforcement, and any challenging behaviors exhibited during feeding are ignored. Therefore, the session continues until the target food is consumed (Anderson and McMillan, 2001). Oftentimes, escape extinction is used in conjunction with other procedures, but escape extinction is typically considered the *active ingredient* in treatment packages (Piazza, Patel, Gulotta, Sevin, & Layer, 2003). Interventions including a NRS component are thought to be effective because the escape contingency between refusal behavior and removal of the demand to eat is terminated (Fernand et al., 2016; Tarbox, Schiff, & Najdowski, 2010).

A challenge in treating food selectivity is the ethical implications involved with physically prompting a child to consume food that they are refusing to ingest (Bandini et al., 2010; Bicer & Alsaffar, 2013; Riordan, Iwata, Finney, Wohl, & Stanley, 1982). Many investigators have advocated for alternatives or adjuncts to negative reinforcement or NRS (Seubert, Fryling, Wallace, Jiminez, & Meier, 2014). Although NRS is considered an empirically validated treatment for food selectivity, social and ecological valid treatments for typical contexts are needed and require consideration. A caregiver, teacher, or therapist may be unable to wait for the target response (e.g., mealtime is over at school; parent has to take their other child to an appointment); therefore, the participant

is able to escape the task due to typical constraints that are present in dynamic environments like the home and the classroom. In addition, the participant may engage in severe problem behaviors such as self-injurious behavior or aggression that can be difficult for a caregiver, teacher, or therapist to manage while implementing the NRS procedures. Therefore, escape extinction may not always be feasible for a caregiver, teacher, or therapist to implement (Tanner & Andreone, 2015), and evaluating alternative treatment procedures is needed in the literature.

Alternatives to Escape Extinction

For interventions that do not include escape extinction, Ledford & Gast (2016) found researchers have effectively used shaping and antecedent manipulations procedures. Less aversive feeding interventions often allow individuals an opportunity to become comfortable with novel foods without escape extinction. With shaping, researchers differentially reinforced behaviors that approximated target responses (e.g., touching, smelling, and tasting nonpreferred food; Koegel et al., 2012). However, outside of escape extinction, a limited number of studies have evaluated behaviorally-based interventions to treating food selectivity. Therefore, it is important to explore alternative treatments to for treating food selectivity in children, regardless of exceptionality (Tanner & Andreone, 2015).

There are limited published studies outside of escape extinction literature in the treatment of food selectivity that are published in peer reviewed journals. A number of studies for treating food selectivity are available in the literature and include single or combined approaches to treatment: choice, differential reinforcement, differential reinforcement of alternative behavior (DRA), graduated exposure, high-probability

instructional sequence, non-contingent reinforcement, positive reinforcement pre-meal sensory integration therapy, sequential oral sensory approach, and stimulus fading. However, the majority of these interventions included escape extinction (Tanner & Andreone, 2015). Also, there are a limited number of published studies in the treatment of food selectivity in school settings that are published in peer reviewed journals. One unpublished study by Gast, Shepley, and Lane (2016), evaluated the effectiveness of an ecologically valid treatment package to increase exploratory behaviors related to eating and consumption of non-preferred foods in a preschool setting. Exploratory behaviors increased for all participants, and problem behaviors decreased during exposure to non-preferred foods, however, only one participant demonstrated consistent increases in consumption of non-preferred foods. There may be more unpublished literature with similar or differing results.

Rationale for the Current Study

According to Gast and colleagues (2016), "Addressing feeding problems in young children may positively impact long-term, potentially life-threatening consequences of maladaptive eating behaviors" (p. 2). Thus, we need to continue to evaluate interventions that are appropriate for treating food selectivity in dynamic settings. It should be noted that more recent reviews on interventions for treating pediatric feeding disorders did not include any studies occurring in schools (Lukens & Silverman, 2014). In addition, fewer studies have evaluated incorporating choices into instruction when targeting food selectivity (Fernand, Penrod, Fu, Whelan, & Medved, 2016); providing a child choice can increase engagement (Reinharsten, Garfinkel, & Wolery, 2002), is relatively easy to implement in dynamic settings (McCormick, Jolivette, & Ridgley, 2003), and decrease

challenging behavior (Dyer, Dunlap, & Winterling, 1990). Fernand et al. (2016) assessed the role of choice as an antecedent manipulation in mediating the potential negative side effects induced by NRS. Results of this study were variable, but indicated that providing choice may be an effective means to increase the consumption of non-preferred foods in the absence of NRS.

Graduated exposure is a less common approach for treating food selectivity, and is not commonly found in the literature. Graduated exposure reduces the motivation to escape the task as food consumption is not required for a correct response, and is potentially less aversive for the participant and the person implementing the procedures when compared to using an escape extinction approach The graduated exposure intervention by Tanner and Andreone (2015) consisted of a 12-step hierarchy and took 100 sessions over the span of nine months to see socially meaningful improvements in the target behavior. Therefore, using such a procedure in a dynamic setting, like a classroom, requires careful considerations in regards to modifications. To facilitate this process video models, physical prompts, environmental arrangements, and preference assessments may be used as needed to address food selectivity.

Video modeling occurs when a student watches a video of a model performing a skill in its entirety and then completes the same skill in the same manner (LeBlanc et al., 2003). Benefits of video modeling include consistency with the delivery of instructional content, and may benefit students who are easily distracted by the environment to focus on the most relevant stimuli (McCoy & Hermansen, 2007). In addition, children may enjoy watching videos and using technology (Charlop-Christy & Danshevar, 2003).

According to Gast and colleagues (2016), “Given the scarce amount of research examining feeding interventions in typical school conditions by indigenous implementers, research evaluating ecologically valid interventions is needed” (p. 4). The purpose of the current study is to evaluate the effectiveness of using a video model, graduated exposure (i.e., touch, smell, try, eat), and positive reinforcement to increase food exploration and increase consumption of non-preferred foods in typically developing or at-risk children that exhibit food selectivity in a school setting.

Section 2: Research Question

When a multicomponent intervention that includes video models and physical prompting is introduced during meal times in a school setting, will children that exhibit food selectivity display an increase in food exploration, through graduated exposure (*touch, smell, try*), and consumption (*eat*) of novel foods when reinforced with preferred foods and materials?

Section 3: Method

Participants

Participants in this study included two preschool-aged children, both male, who were between 3 and 4 years of age and enrolled in a university-based preschool program; both participants had received early-intervention services. Inclusion criteria were as follows: (a) between the ages of 3 years-old and 10 years-old; (b) consistently consumed no more than 5-10 foods; (c) often exhibited food refusal when presented with non-preferred or new foods; (d) exhibited problem behavior during mealtimes; (e) were able to self-feed (finger foods) and drink from an open or closed cup; (f) sat for the duration of meals (up to 15 min); (g) imitated motor behaviors; (h) followed simple one and two step commands; (i) waited 5 s for a prompt; (j) tolerated a physical prompt; and (k) attended school at least 80% of school days within the last month. Inclusion criteria were evaluated by interviewing the parent and classroom teacher and reviewing a food log. Participants were excluded from the study based on teacher and parent report if they (a) had received any type of feeding therapy; (b) displayed oral motor limitations/challenges (e.g., feeding modifications, oral motor structure issues); and (c) had any health conditions that would contribute to food selectivity (e.g., biological feeding disorder).

Craig was a 3.5-year old boy who, along with his twin sister, were born premature at 35.5 weeks. Craig received speech and occupational therapy services via Part C services from ages 1-3 years. Craig continued to receive private speech and occupational therapy services during the time of the study. Prior to the study Craig's diet consisted of peanut butter toast, edamame, plain pasta, Kraft Mac and Cheese, McDonalds chicken nuggets, Strawberries, Motts fruit snacks, dry Cheerios, and Lays potato chips. Parent

reported that Craig often refused to come to the table during mealtimes and engaged in tantrum behaviors (*e.g. crying, food* refusal) during mealtimes. The teacher report indicated Craig often engaged in food refusal during snack time unless the snack item was a preferred food item. Paul was a 4.8-year old boy who, received speech services when he was 2-3 years old. Prior to the study Paul consumed bacon, frosted cinnamon and sugar Pop Tarts, McDonalds chicken nuggets, straight and medium temperature (e.g. "not too hot") French fries, Cheetos, strawberries, bananas, and dry Cheerios. His parent reported that Paul often refused to come to the table during mealtimes. Both the parent and teacher reported Paul often engaged in food refusal unless food items were preferred. The author served as the researcher in this study. The researcher was a licensed special education teacher, held a bachelor's degree in special education, and was working towards a master's degree in applied behavior analysis at a public university.

Instructional Setting and Arrangement

All sessions occurred in the participants' classroom settings. There were approximately 17 children, 1-2 assistants, and one teacher in Craig's classroom, and approximately 17 children, 1-2 assistants, and one teacher in Paul's classroom while sessions were being conducted. Data were collected for each student one time per day between 10:45 a.m.-11:25 a.m. Sessions occurred 15-30 min prior to lunch, as part of a typical mealtime schedule to create a natural opportunity for the participant to be at a natural state of deprivation so that they were likely hungry and, as such, motivated to engage in target behaviors, and likely to find eating reinforcing. Sessions lasted an average of 4.8 min for Craig, and an average of 6 min for Paul. During the teaching

sessions, the participants sat beside the researcher at a table to avoid distractions. The researcher sat slightly behind the participant for prompting purposes.

Materials

Materials included two plates that each measured 152 mm. One plate for preferred finger foods and one for non-preferred finger foods; at least three preferred and non-preferred finger foods were available per session. Target foods were selected based on caretaker preference. Craig's three preferred target foods were Lays potato chips, Motts fruit snacks, and edamame. Craig's three non-preferred target foods were cheese pizza, broccoli, and ham. Paul's three preferred target foods were bacon, Cheetos, and frosted brown sugar Pop Tarts. An additional reinforcer of vanilla ice cream was added to Paul's preferred food plate. Paul's three non-preferred foods were green beans, peas, and broccoli. In addition, each session included an iPad Mini to show the video model. The video models consisted of four separate video clips that modeled each target behavior (*touch, smell, try, eat)*; these clips were filmed from a third-person perspective. In addition to demonstrating the four target behaviors, each video clip also included a one-sentence voice-over instruction stating each target behavior (Canella-Malone et al., 2006). Additional materials included tangible reinforcers, and a reinforcer menu measuring 203 mm by 254 mm (Appendix C). A paper parent interview questionnaire, paper teacher interview questionnaire, and a paper pre/post food log were used prior to and after completion of the study.

Experimental Design

A multiple probe design across behaviors replicated across participants was used to evaluate the effectiveness of the treatment package. This design allows for data to be

collected intermittently prior to the introduction of the intervention, and continuous data to be collected during the intervention condition. Intermittent data collection in the pre-intervention condition is appropriate when it is anticipated that the target behavior will improve when and only when the intervention is introduced (less likely to observe covariation when intervening on other target behaviors). In addition, a time-lagged design is appropriate for evaluating reversible and non-reversible behaviors (Kratochwill et al., 2013). This design allows for the assessment of a functional relation by staggering the introduction of the independent variable across functionally independent but similar target behaviors. A functional relation is demonstrated when at least three basic effects are observed in the data at three different points in time. Data were visually analyzed to ensure a stable pattern of responding across all tiers before the intervention was introduced in Tier 1, and in subsequent tiers (Kratochwill et al., 2013). Probe sessions were planned for every 8 sessions to detect for covariation in untreated tiers (What Works Clearinghouse guidelines; Kratochwill et al., 2013). An exception to this plan occurred when covariation was detected for Craig in Tier 3 and the intervention was introduced during the next session, a limitation of the study (i.e., the researcher should have extended the pre-intervention condition data until a clear pattern of responding was established prior to introducing intervention). Generalization data in the form of adult responses to a food log questionnaire were collected and evaluated within a pre-and post-test design. Given the nature of the design, any changes in target behaviors outside of instructional sessions were considered correlational.

Screening Procedures

Prior to treatment, the participant's parents provided consent from their child's pediatrician to participate in the study. A parent and teacher pre-interview were conducted by the researcher. The researcher met with each participant's parent and teacher in person. The parent and teacher post-interview took place via phone. Each interview lasted approximately 1 hour. The researcher asked the parent and teacher the interview questions (Appendix B). In addition, a parent was provided with a mealtime behavior questionnaire that was completed and returned to the researcher (see Appendix B).

General Procedures

Sessions were conducted once a day between 10:45 a.m. and 11:20 a.m., 4 days a week in the classroom prior to lunch. Three non-preferred target finger foods, and three preferred finger foods (presented as part of the consequent event), were presented on separate plates, and were used in each session. Prior to each session, a reinforcer menu was presented to the participant (in addition to preferred food plate), with the selected tangible item provided at the end of the session for attending behaviors. Probe sessions consisted of three trials per behavior (e.g., *touch, smell, try, eat*) totaling 12 randomly sequenced trials per session. The researcher selected the sequence using the rule of no more than two consecutive trials for a single target behavior during a session (e.g., no more than two consecutive trials instructing the participant to taste the non-preferred food; interspersed opportunities to display the target behaviors across the session). The independent variable was a treatment package that included a video model in the antecedent event of trials, along with a physical prompt provided as needed (delivered if

the participant did not display the target behavior within 5 s of the task direction). Reinforcers in the form of preferred foods and activities or tangibles (e.g., toys) were provided at the end of a session. During intervention sessions, 10 trials were conducted per session for a single target behavior (e.g., touching non-preferred food). If the participant independently engaged in the target behavior, he would receive verbal praise, and access to a preferred food item. A 3- 5 s inter-trial interval was utilized during sessions. The mastery criterion for each tier was 100% unprompted correct responses across two consecutive days. If the physical prompt evoked problem behavior (e.g., aggression) across five consecutive sessions, then the researcher would have moved to a system of least prompts procedure, however, problem behavior never occurred.

Probe Condition

During probe sessions, the researcher presented three non-preferred foods on a colored plate, and rotated the orientation of the food presentation on the plate throughout the session. A trial consisted of the researcher providing an attending cue (e.g. "ready" or "okay"), and presenting three non-preferred food items on a designated colored plate to the participant. Once the participant displayed an attending response (i.e., oriented to materials), a verbal task direction was provided by the researcher (e.g., *touch, smell, try, eat*) allowing 5 s for a response; no prompts were provided. The participant was given the opportunity to choose the non-preferred target finger food. If the participant attended and independently engaged in the target behavior, they received behavior specific praise (e.g. "good touch"), and access to a preferred food item on a variable ratio schedule of reinforcement every third response (VR-3). If the participant did not respond or displayed a non-target behavior, the researcher waited the inter-trial interval and began the next

trial. A preferred tangible item was presented for attending behaviors at the end of the session.

Intervention Condition

Intervention procedures were identical to probe sessions, with the addition of the independent variable. Following the participant's attending response, the researcher controlled the iPad and presented a video model depicting the target behavior (dependent on the condition; *touch, smell, try, eat*). If the participant independently engaged in the target behavior, they received behavior specific praise and access to a preferred food item. The researcher waited 5 s for the participant to comply with the direction and provided a controlling prompt (e.g. physical hand over hand) if needed. If the participant did not engage in the target behavior, the prompt consisted of the researcher placing her hand on top of the participant's hand and guiding the participant to touch the food in the touch session, place the food near the participant's nose for the smell session, and touch the food to the participant's mouth or tongue during the *try* session (Gast, Shepley, & Lane, 2016). The prompt for eating non-preferred foods consisted of the researcher placing their hand on top of the participant's hand and guiding the participant to hold a piece of food a distance of 25 mm to 50 mm from their mouth for 5 seconds. If the participant resisted the physical prompt, the trial ended, and the response was scored as prompted incorrect for that trial. A preferred tangible item was presented for attending behaviors at the end of the session.

Modifications

Due to a lack of responding in Tier 4 (*Eat* Condition), Paul required modifications to the intervention procedures. The criterion for adding a modification included 2-3

consecutive sessions of 0% unprompted correct responses. During session 10, the contingency of ending the session following a single bite was introduced, along with an increase in the amount of the reinforcer (half of a Pop Tart instead of a small bite). During session 12, a new video model was introduced that was identical to the previous video model, but now included the session ending after engaging in target behavior once and receiving half of a Pop Tart on the plate of preferred food. During session 15, additional reinforcers which included vanilla ice cream and a Hot Wheel toy car were added as options along with the preferred food plate. During session 18, an environmental modification in the form of conducting sessions without peers present was introduced to minimize distractibility during sessions.

Generalization

The food log questionnaire was administered to assess if the participant engaged in any of the four target behaviors and assessed the number of different non-preferred foods consumed. If the participant engaged in any of the four target behaviors in their typical day during mealtimes, the parent or teacher recorded the participant's responses on the questionnaire (Tanner & Andreone, 2015).

Maintenance

Maintenance procedures were identical to probe sessions. Maintenance probes were collected once every 8 sessions for Tiers 1, 2, and 3 (*touch, smell, try*).

Dependent Variables and Measurement

Four dependent variables were measured during this study. *Touch* was defined as placing at least one finger on a non-preferred food. Examples included picking up the entire piece of food and touching the piece of food with two fingers. Non-examples

included picking up the food item and throwing the food on the floor or dropping the food on the floor. *Smell* was defined as a participant having a non-preferred food within a minimum of 25 mm to 50 mm of his mouth or nose (inhalation was not required). Examples of this behavior included the participant bending over the target food and placing their nose onto the food item. Non-examples of this behavior included the participant's cheek or forehead coming within a minimum of 25 mm to 50 mm of a non-preferred food. *Try* was defined as the participant touching a non-preferred to his lips, tongue, or teeth (swallowing was not required). Examples of this behavior included taking a bite of food and expelling the food or rubbing the food on his lips. Non-examples of this behavior included the participant touching a non-preferred food to his chin, cheek, or neck. *Eat* was defined as the participant consuming a piece of a non-preferred food without expelling the food. Examples of this behavior included taking a bite of a non-preferred food item and moving it around in his mouth prior to swallowing or taking a bite of food and swallowing it. Non-examples of this behavior included the participant placing a piece of a non-preferred in his mouth and then expelling the food. The observer scored any differing response topography as an incorrect response. In addition to food exploration and consumption, problem behaviors were monitored during sessions – refusal, expel, gag, and successful or attempted escape from sessions. Refusal was defined as any verbal or nonverbal gesture of declining a non-preferred food item. Examples of this behavior included saying "no," pushing the plate away, throwing food, and turning his head away. With the exception of the target behavior *try,* expel was defined as any time the participant placed food in their mouth and removed it without consuming it. Gag was defined as any instance of retching or dry-heaving. Physical

escape was defined as any instance the participant attempted to or successfully left the instructional area upon presentation of verbal task direction (Gast et al., 2016).

Data were collected using trial-by-trial event recording for each session. Responses were scored as unprompted correct, unprompted incorrect, prompted correct, prompted incorrect, and no response. The researcher scored unprompted correct responding when a participant independently touched, smelled, tried, or ate a piece of non-preferred food within 5 s of the task direction for the behavior. A response was scored as unprompted incorrect responding when the participant responded in any way other than touching, smelling, trying, or eating a piece of non-preferred food within 5 s of the initial cue for a behavior. Prompted correct responding occurred when the participant displayed a correct response within 5 s of the physical prompt to display the target behavior. A response was scored as prompted incorrect responding when the participant engaged in a behavior other than touching, smelling, trying, or eating a piece of non-preferred food within 5 s of the physical prompt. No response referred to anytime the participant did not engage with the food during a trial, or resisted the prompt. Any gagging behavior was recorded on the data sheet, and a plan was developed for removing foods that consistently evoked a gagging response for two consecutive sessions (Tanner & Andreone, 2015).

Reliability and Fidelity

Interobserver Agreement (IOA) and Procedural Fidelity (PF) were collected for at least 20 % of sessions in each condition (e.g. baseline, intervention) for each participant (see Appendices E and F). Secondary data collectors (students enrolled in an applied behavior analysis master's program) were not blind to the conditions of the study. Each

master's student received one training session on all procedures of the study, as well as how to collect data on the corresponding data sheet. Sessions consisted of an initial review of procedures, followed by role playing, reviewing operational definitions of target behaviors, and correctly recording and coding responses on data sheets.

IOA was calculated for target responses by using trial-by-trial agreement and dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. IOA data were collected 33% of probe sessions and 25% of treatment sessions for Craig. The resulting percentages of agreement ranged from 90-100% with a mean of 98%. One IOA error was a disagreement for a prompted correct response and another a disagreement related to the operational definition for smelling a non-preferred food. IOA data were collected 67% of probe sessions and 35% of treatment sessions for Paul. The resulting percentages of agreement were 100% for all IOA sessions. No IOA data were collected for generalization probes, as generalization probes relied solely on parent and teacher report and food questionnaire (Appendix A, Appendix B).

PF was calculated by dividing number of observed behaviors by the number of planned behaviors and multiplying by 100. PF was collected on the following researcher behaviors: (a) presented attending cue "Ready?" and waited for attending response, (b) presented a reinforcement menu at the beginning of the session, (c) presented 3 preferred and 3 non-preferred target foods on two designated colored plates at beginning of session, (d) presented a video model of target behaviors during intervention sessions, (e) presented the controlling prompt within 5 s of the task direction if no response or an incorrect response occurred, and (f) delivered reinforcement as planned. PF data were

collected 33% of probe sessions and 25% of treatment sessions for Craig. PF across all treatment sessions for Craig ranged from 89-100% with a mean of 97.8%. One PF error was recorded in regard to 5 s wait time. PF data were collected 67% of probe sessions and 35% of treatment sessions for Paul. PF across all treatment sessions for Paul was 92 to 100% with a mean of 97%. PF errors included lack of VR3 praise, 5 s wait time, inter-trial wait time, and one attending cue error.

Social Validity

Social validity data were collected at the end of the study by the classroom teachers and the participants (see Appendices K and L). The researcher measured social validity by asking the classroom teacher to respond to questions using a Likert-type scale ranging from a scale of 1 to 10 (Appendix K) and by asking participants to vocally respond to a question (Appendix L). The social validity measure for the teacher included the following five questions: (1) How much did the trainings and teacher feedback interfere with your roles and responsibilities as a teacher? (2) How much did the instructional sessions interfere with your role and responsibilities as a teacher? (3) How important do you feel this decreasing food selectivity intervention was for your student? (4) How do you think the student enjoyed the intervention? (5) How important is it for children to explore and consume a variety of foods in their diet? Participants were asked, *Did you enjoy working with the researcher on touching, smelling, trying, and eating new foods?*

Section 4: Results

Visual analysis of data was conducted by assessing level, trend, stability, overlap, consistency of effect, and immediacy of effect. Also, given the use of a multiple probe design across behaviors replicated across participants, vertical analysis of data occurred. Each of these were considered and reviewed when conducting a formative and summative analysis and determining presence or absence of a functional relation (Lane & Gast, 2014). The results indicated that the treatment package was effective in increasing the food exploration and consumption of non-preferred foods for one participant, and was inconclusive for the second participant. Figures 1 and 2 show the percentage of independent unprompted correct responses across the four target behaviors: *touch, smell, try,* and *eat.* The introduction of the treatment package was staggered across four tiers for each participant. The results will therefore be described for each participant separately.

Craig

Craig's percentage of unprompted correct responses for target behaviors is shown in Figure 1. During the initial pre-intervention sessions, the data paths indicated a zero-celerating trend for unprompted correct responses across all four target behaviors. Following introduction of the intervention in Tier 1, an immediate and abrupt change in level was observed, followed by an accelerating trend in a therapeutic direction in subsequent sessions until the mastery criterion was met at 100% unprompted correct responding for consecutive sessions. This pattern of responding was consistent and observed in Tiers 2 and 4, for smelling and eating, respectively, with no overlap observed between probe and intervention sessions (Tiers 1-2, 4). Similarly, vertical analysis of data in Tiers 2 and 4 indicated that the target behaviors only improved when and only when

the intervention was introduced. In contrast, covariation was observed in Tier 3 *try* (session 10 with 100% unprompted correct responding), with data indicating improvements in trying food once the intervention for smelling non-preferred food was introduced. Although covariation of exploration occurred, the researcher continued to proceed and implement the intervention to continue targeting food exploration to expose the participant to placing non-preferred food in his mouth before asking him to eat non-preferred foods. Craig met the mastery criterion in 3 sessions for *touch,* 5 sessions for *smell*, 8 sessions for *try,* and 4 sessions for *eat.* Maintenance data indicated Craig displayed and maintained the same levels in responding 100% unprompted corrected across all three target behaviors. Three effects and one non-effect were observed in the data and, as such, a functional relation was present for exploration and consumption of non-preferred foods.

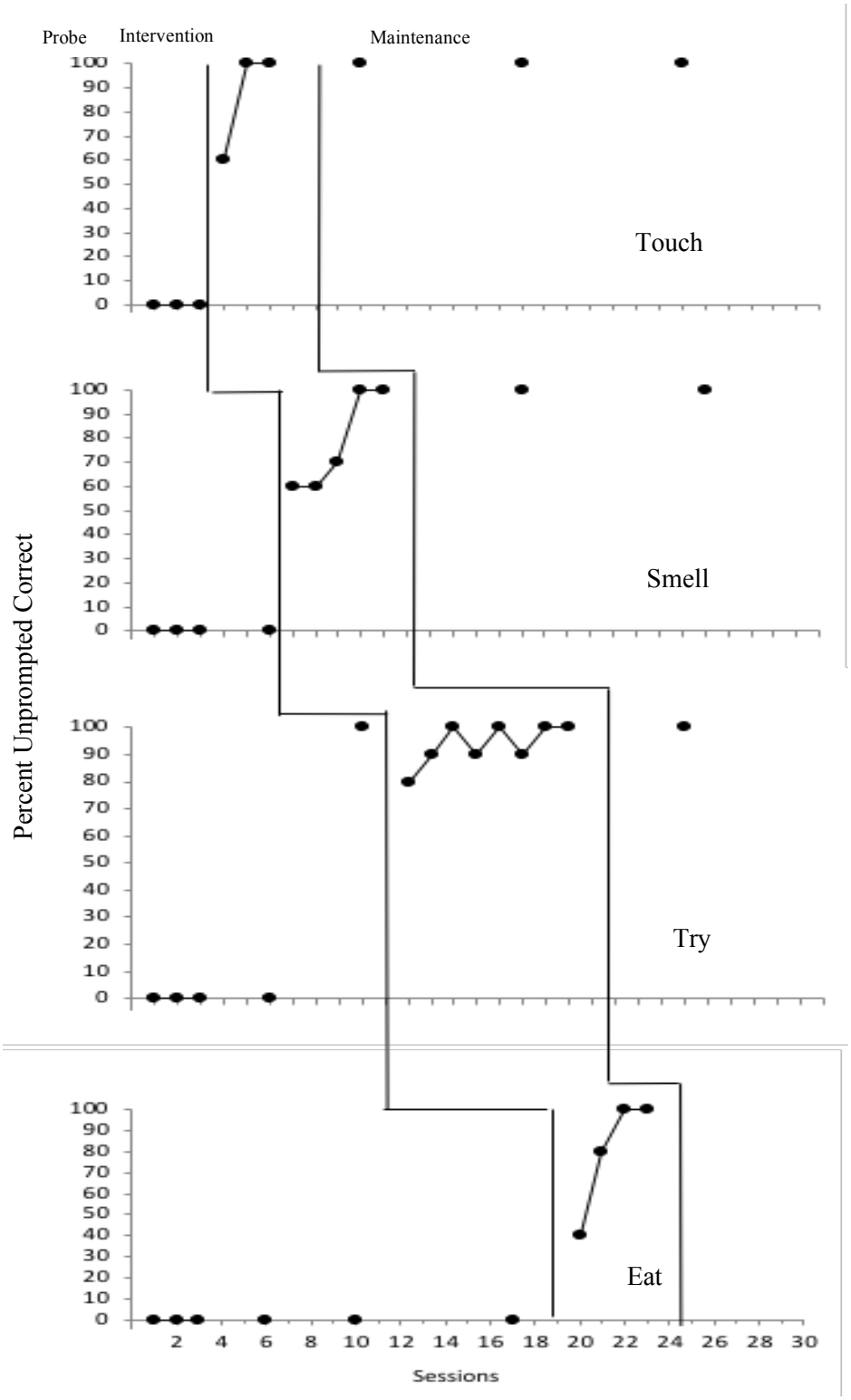


Figure 1. Craig's percentage of unprompted correct responses.

Paul

Paul's percentage of unprompted correct responses is shown in Figure 2. During the initial pre-intervention sessions, Paul engaged in the target behaviors of touching and smelling non-preferred foods 100% of opportunities and maintained those behaviors throughout the study. In contrast, he did not engage in the target behaviors of tasting or eating non-preferred foods (zero-celerating trend in the pre-intervention condition). For ethical purposes, we chose to intervene on the last two behaviors. Upon introduction of the intervention in Tier 3, an immediate change in level was observed along the ordinate, with an accelerating trend in the therapeutic direction observed in subsequent sessions until Paul met the mastery criterion in 4 sessions*;* maintenance data indicated that Paul maintained the target behavior. When the intervention was introduced in Tier 4, a zero-celerating trend was observed in unprompted correct responses for 9 sessions and, as such, modifications were made to the intervention. A zero-celerating trend was observed across phase changes until the fourth modification was introduced (i.e., environmental modification). During session 17, Paul engaged in the target behavior *eat*, and ate one bite of non-preferred food (unplanned; peers left the room for an activity). Across all remaining sessions, sessions only included the researcher, Paul, and a staff member (she was present but did not interact with Paul); peers were not present. Paul was required to eat 2 bites during session 18 and 3 bites during session 19 in order to access reinforcement. The *Eat* condition was terminated following these sessions.

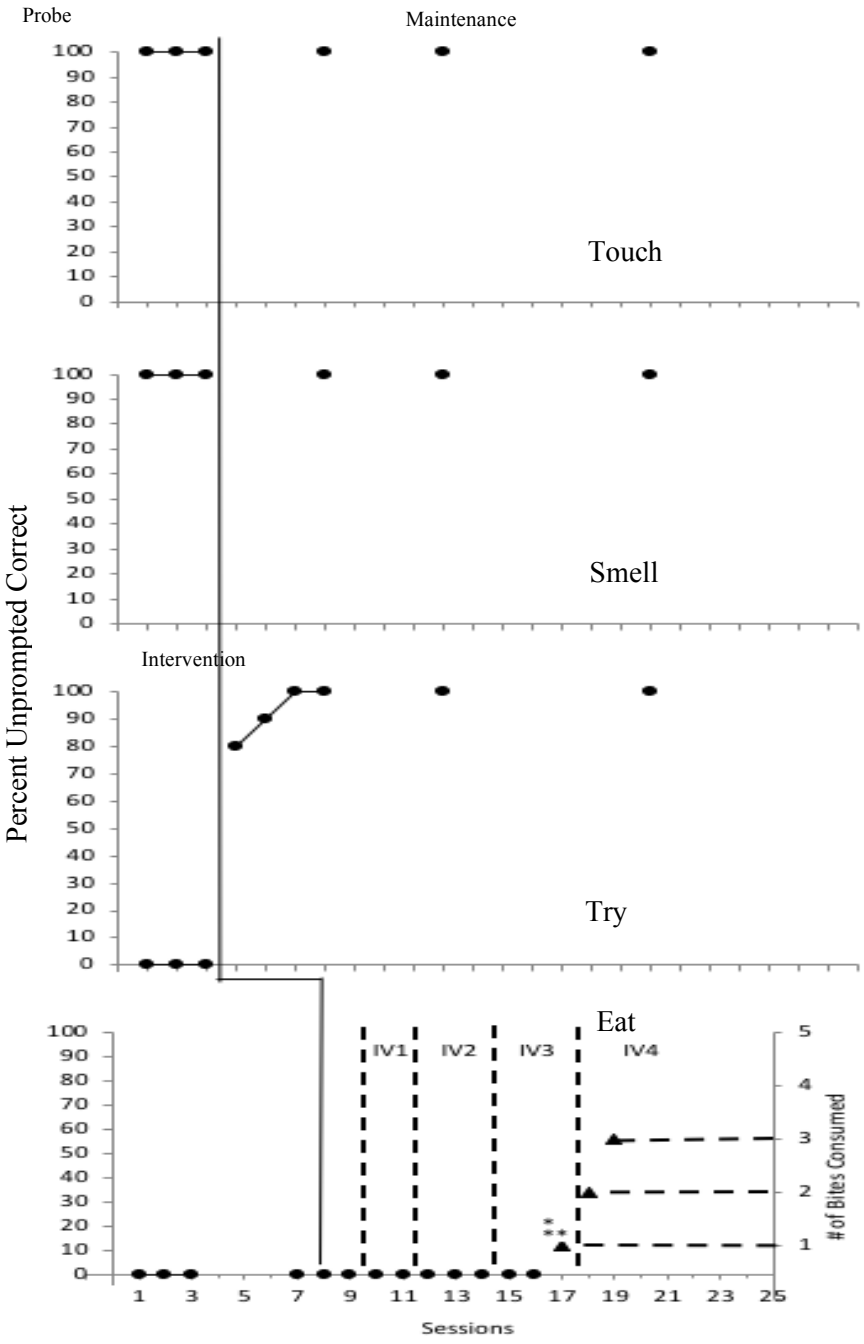


Figure 2. Paul's percentage of unprompted correct responses.

*100% 1/1, **unplanned change children out of room, IV1=1 bite ends session + ½ Pop Tart, IV2=IV1 + new video model, IV3=IV1+IV2+ice cream and Hot Wheel toy car, IV4=IV1+IV2+IV3+no children in classroom. Number of bites consumed represented by closed triangles.

Generalization

According to data from the pre-test completed by a parent and the teacher, Craig consumed 9-10 different foods per week. Post-test data indicated that Craig added two new types of meat to his food repertoire at home (parent report) and his teacher reported that he had added Chex mix to his food repertoire. Craig's parent reported that she was *shocked at the fact that Craig put a piece of lettuce in his mouth during dinner* on one occasion. Both the parent and teacher report indicated that Craig's problem behaviors during meal times had *somewhat* decreased. Craig was more willing to come to the table during mealtimes and engaged in less tantrum-related behaviors (*crying, food refusal)* during mealtimes in the home setting.

According to data from the pre-test completed by a parent and the teacher, Paul consumed 8 different foods per week. Post-test data completed by the teacher indicated that his preferred foods at school had remained the same. Paul's parent reported that he had added chicken strips, chicken tenders, different brands of chicken nuggets, different types of French fries, and pineapple to his food repertoire. Both the parent and teacher indicated that Paul's problem behaviors during mealtimes had decreased. The parent and teacher both reported Phillip was more willing to come to the table during mealtimes in both the home and school setting.

Social Validity

Both Craig and Paul's classroom teachers indicated that the treatment package did not directly impact their roles or responsibilities as a teacher. In addition, both teachers indicated the intervention was *very valuable* for improving the target behaviors, with differing responses related to the extent to which each participant enjoyed sessions

(*enjoyed* and *somewhat enjoyed*, respectively). When each participant was asked, *Did you enjoy working with the researcher on touching, smelling, trying, and eating new foods?*, Craig answered with "Yea" and Paul said "It was good."

Section 5: Discussion

The purpose of the current study was to evaluate the effectiveness of using treatment package that consisted of a video model presented in the antecedent condition of a trial and a physical prompt (as needed) to improve exploration (touch, smell, taste) and consumption of non-preferred foods in young children that exhibited food selectivity in a school setting. The intervention was introduced across behaviors as a type of graduated exposure to feeding behaviors (increased expectations). This intervention gradually exposed each participant to targeted non-preferred foods (Tanner & Andreone, 2015) by first asking them to touch a non-preferred food, followed by smelling and trying the food, before asking them to eat a bite of the non-preferred food. This was done to reduce the likelihood that participants would engage in challenging behaviors to escape mealtime in typical and dynamic settings like classrooms. In a school setting, more intrusive interventions, such escape extinction and NRS, would likely require a location outside of the classroom, due to potential challenging behaviors that may occur during sessions. As a result, this study evaluated alternative treatment procedures in teaching exploration and consumption of non-preferred foods in the classroom.

Results indicated this intervention may be effective for increasing exploration and consumption of non-preferred foods in children, but some children may require modifications before consuming non-preferred foods. In addition, Craig displayed limited to no challenging behaviors during sessions and parents/teachers reported decreases in challenging behavior around mealtimes. Paul had one occurrence of problem behavior during the final session in the *Eat* condition. Paul engaged in gagging and crying for 3 consecutive trials. The researcher offered Paul an opportunity to escape and end the

session; Paul denied escape and told the researcher he wanted to keep trying. Also, teachers indicated that the intervention was appropriate for the classroom, and participants indicated they enjoyed the intervention procedures. Thus, this intervention may be a socially valid approach to targeting food selectivity in the classroom. Tanner and Andreone (2015) and Schmidt and colleagues (2013) also used a form of graduated exposure along with positive reinforcement to teach children to explore and consume non-preferred foods, however, in this current study both participants did not have a diagnosis of ASD.

Limitations

There are several limitations to this study. First, parent and teacher report may be an unreliable source for identifying child-preferred reinforcers. Preference assessments could have been used not only to identify highly-preferred foods that could be delivered as a consequence for consumption of novel foods, but also could be used to inform the selection of foods to target during intervention (Penrod & VanDalen, 2015). A second limitation is that a brief functional assessment was not conducted prior to the beginning of the treatment package; therefore, a conclusive function for food selectivity for each participant was never determined. A third limitation was that sessions occurred prior to lunch time. This time of day was chosen in order for each participant to be in a natural state of deprivation so that eating would possibly be more reinforcing. However, shortly after each participant's session, lunch occurred, which allowed the participant to immediately access their preferred food items in their lunchbox. This could have made the preferred food plate less reinforcing for Paul to engage in trying and eating non-preferred foods. A fourth limitation was that a methodological error was made by the

researcher with Craig during session 10 of the intervention condition *smell*. Covariation occurred during probe session 10 in Tier 3 (*try*). The researcher should have continued to probe until data were stable prior to the implementation of intervention. Therefore, experimental control was not established in Tier 3 (*try*). A fifth limitation was that due to multiple modifications to procedures for Paul, it was unclear what led to improvements in consuming the non-preferred food. A sixth limitation was that screening procedures for Paul led to variable results in the probe condition. Paul performed two of four target behaviors to 100% (*touch, smell*). However, the researcher continued intervention with Paul for ethical reasons targeting increasing exploration and consumption of non-preferred foods.

Implications for Practice and Research

The results of this study provide implications for providing teachers, parents, practitioners, and researchers less intrusive interventions when working with young children who exhibit food selectivity.

1. The treatment package used in this study was relatively easy-to-implement, and may be an effective strategy for increasing exploration and consumption in children, but some children may require modifications before consuming non-preferred foods. It should be noted that a master's level researcher implemented procedures and, as such, those in practice will likely require training before implementing procedures with fidelity. Relatedly, future research should explore using the parent or teacher as the implementer rather than the researcher.
2. In addition, future studies should consider the extent to which having peers present facilitates or inhibits exploration and consumption of non-preferred food

in the classroom. Relatedly, if peers do not inhibit such behaviors, implementing the same intervention in a small group format that includes peer models may be a relatively easy method for targeting food selectivity.

3. Data from parent interviews indicated that both participants increased their food repertoire at home and that challenging behaviors decreased in the home environment. Future studies should monitor generalization to the home environment within the context of an experimental design.
4. Relatedly, Paul's parents indicated that he began to accept and consume different brands of preferred foods. Future research should consider investigating the relationship between systematic desensitization and consuming different brands of preferred foods rather than targeting only non-preferred foods for exploration and consumption.
5. Fernand and colleagues (2016) found that providing choice may be an effective means to increase the consumption of non-preferred foods in the absence of NRS. Anecdotal observations suggested each participant only chose to engage with one of the three non-preferred target foods for each session. Craig only engaged in exploration and consumption of broccoli, while Paul only engaged in exploration and consumption of peas (all of Paul's non-preferred foods were green vegetables). Thus, a comparison study that includes different categories of non-preferred food items should be explored in future research studies.
6. In addition, considerations related to reinforcers included during sessions warrants further investigation. Paul only interacted with one of the three preferred food items. Although, all three preferred items were offered for unprompted correct

responses, Paul only chose to accept the brown sugar frosted Pop Tart. When half of a Pop Tart was offered to Paul during the first modification, he only chose to eat one bite during each trial. Future research should continue to explore the impact choice has on food selectivity interventions. Anecdotal observations suggested that preferred tangibles such as the Hot Wheel toy car for Paul may have played a more significant role than preferred food items in establishing the motivating operation to engage in the target behavior of eating non-preferred food, however this possible relation was not systematically investigated. Further research on conducting a daily food and tangible preference assessment may lead to improvements in consumption of non-preferred food . In the context of treatment for food selectivity, preference assessments can be used not only to identify highly preferred food that can be delivered as a consequence for consumption of novel foods, but may be used to inform the selection of non-preferred foods and preferred tangibles to target during intervention (Penrod & VanDalen, 2015). Therefore, future researchers might consider conducting multiple pre-treatment assessments prior to the introduction in the treatment of food selectivity.

7. Curtin et al. (2015) noted that "Not all children with feeding problems require the same intensive interventions, and thus additional research on interventions of varied intensities is warranted" (p. 3312).

Conclusions

Given that many investigators have advocated for alternatives or adjuncts to NRS (Seubert et al., 2014), this study remains an important contribution to the literature by

providing an example of a less intrusive and socially valid feeding intervention. This study supports the need for further rigorous intervention studies, with the aim of providing evidence-based methods to assist children that exhibit food selectivity in increasing food exploration and consumption of non-preferred foods. Although it is difficult to draw definitive conclusions from this study, further research in the attempt to improve our understanding of alternative interventions to NRS is needed.

Appendix A: Pre/Post Food Log

Food Category	Check
Breads:	☐ White bread ☐ Wheat bread ☐ Bagels ☐ Crackers ☐ Other: _____
Vegetables:	☐ Corn ☐ Peas ☐ Broccoli ☐ Spinach ☐ Lettuce ☐ Green beans ☐ Other: _____
Sweets:	☐ Cookies ☐ Cake ☐ Ice Cream ☐ Candy ☐ Fruit Snacks ☐ Other: _____
Fruits:	☐ Strawberries ☐ Blueberries ☐ Apples ☐ Oranges ☐ Grapes ☐ Melons ☐ Pineapple ☐ Other: _____
Protein:	☐ Eggs ☐ Ground Beef ☐ Steak ☐ Chicken ☐ Tofu ☐ Fish ☐ Other: _____
Drinks:	☐ Milk ☐ Juice ☐ Water ☐ Other: _____

Appendix B: Pre/Post Parent/Teacher Interview Questions

0 = Never 1 = Sometimes 2 = Often 3 = Always

1. My child/student often refuses to come to the table when it's time to eat?

   0 1 2 3

2. My child/student has tantrums or engages in problem behaviors during mealtime?

   0 1 2 3

3. My child/student complains about the food that is served to them?

   0 1 2 3

4. My child/student seeks a lot of attention during mealtime?

   0 1 2 3

5. My child/student often refuses to eat most food?

   0 1 2 3

6. My child will only eat between 5-10 foods on a daily basis?

   0 1 2 3

7. How likely is your child/student to try new foods?

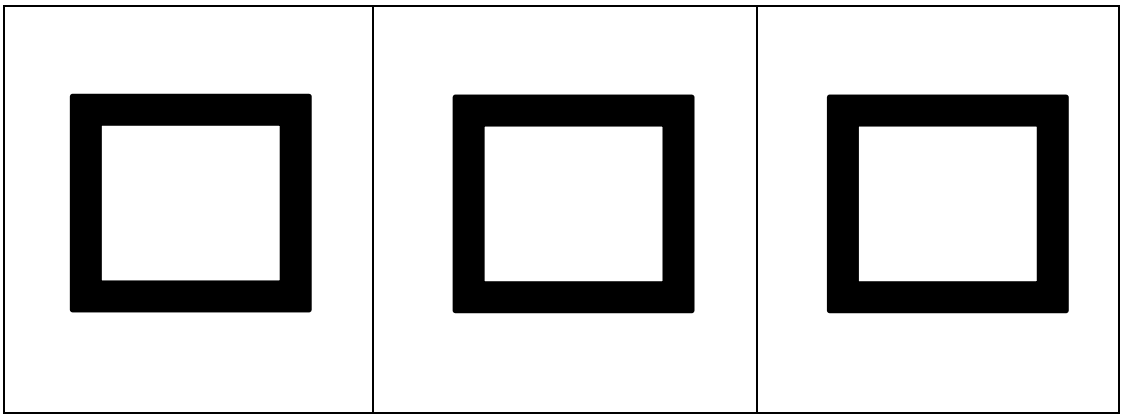
   0 1 2 3

8. What are preferred food items that your child/student will eat?

9. What are your child's /student's most highly preferred foods?

10. What non-preferred food items do you wish your child/student would consume that you cook or serve often?

Appendix C: Reinforcement Menu Template



Appendix D: Pre-Intervention Baseline Probe

Procedural Fidelity and IOA Data Collection Form

Pre-Intervention Baseline Probe Data Collection
Procedural Fidelity & IOA

Child: __________ **Date:** _______ **Session #: 3** **Instructor:** ____________ **Setting:** _______________

Time of Start of Session:_____ **Time at End of Session:** ______

Randomized Target Behavior(s):____

Data Coding Key: *UC=Unprompted Correct* *UI=Unprompted Incorrect* *NR = No Response*

Session #	Target Behavior	Adult Presented preferred & non-preferred food plates	Adult Provided Reinforcement Menu	Adult Provided Attending Cue "ready or okay" and presented non-preferred food plate with verbal task direction.	Adult waited 5-s for child to respond without a prompt	Adult waited 3-5 s between trials for incorrect and NR	Child engaged in target behavior	Adult provided verbal praise and edible for independent correct target behavior	Adult provided VR-3 verbal praise for attending	Preferred Tangible item presented at end of 12 trials.
1							UC UI NR			
2							UC UI NR			
3							UC UI NR			
4							UC UI NR			
5							UC UI NR			
6							UC UI NR			
7							UC UI NR			
8							UC UI NR			
9							UC UI NR			
10							UC UI NR			
11							UC UI NR			
12							UC UI NR			

Summary of Data			
% Unprompted Correct Touch		% Procedural Fidelity	
% Unprompted Correct Smell		*% Reliability*	
% Unprompted Correct Taste			
% Unprompted Correct Eat			

Appendix E: Intervention Probe Sessions Data Collection Form

Intervention Probe Sessions

Child: __________ **Date:** _______ **Session #:**_____ **Instructor:** ____________ **Setting:** ______________

Time of Start of Session:_____ **Time at End of Session:** ______

Target Behavior (circle one): Touch Smell Taste Eat **Data Collector:** ________________________

Data Coding Key: UC=*Unprompted Correct* ***PC***=*Prompted Correct* ***UI***=*Unprompted Incorrect* ***PI***=*Prompted Incorrect* ***NR*** = *No Response*

Trial #	Child Engaged in Target Behavior					Problem Behavior		Comments:
1	UC	PC	UI	PI	NR	Yes	No	
2	UC	PC	UI	PI	NR	Yes	No	
3	UC	PC	UI	PI	NR	Yes	No	
4	UC	PC	UI	PI	NR	Yes	No	
5	UC	PC	UI	PI	NR	Yes	No	
6	UC	PC	UI	PI	NR	Yes	No	
7	UC	PC	UI	PI	NR	Yes	No	
8	UC	PC	UI	PI	NR	Yes	No	
9	UC	PC	UI	PI	NR	Yes	No	
10	UC	PC	UI	PI	NR	Yes	No	

Mastery Criterion: 100% unprompted correct responses across two consecutive days.

Summary of Data	
% Unprompted Correct	
% Prompted Correct	

Appendix F: Intervention Procedural Fidelity and IOA

Data Collection Form

Intervention Sessions

Procedural Fidelity and IOA

Child: __________ **Date:** _______ **Session #:**_____ **Instructor:** ____________ **Setting:** ______________

Time of Start of Session:_____ **Time at End of Session:** ______

Target Behavior (circle one): Touch Smell Taste Eat **Data Collector:** ________________________

Data Coding Key: UC*=Unprompted Correct* ***PC****=Prompted Correct* ***UI****=Unprompted Incorrect* ***PI****=Prompted Incorrect* ***NR*** *= No Response*

	1	2	3	4	5	6	7	8	9	10
Adult presents preferred & non-preferred foods on plate & Reinforcement Menu										
Adult provides attending cue ("ready" or "okay") and presents 3 non-preferred food items on a plate to the participant and the iPad.										
Adult presents the video model										
Adult provides verbal task direction if necessary										
Adult waits for 5 s.										
Child Independently engages in target behavior **(UC)**	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
Adult provides reinforcement										
Child does not engage in the target behavior in response to video or task direction after 5 s.										
Adult provides controlling prompt (hand over hand)										
Child responds correctly to prompt engaging in target behavior **(PC)**	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC
Adult provides reinforcement										
Child resists the prompt for 5 s **(PI)**	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Child responds in any way other than target behavior within 5 s interval **(UI)**	UI	UI	UI	UI	UI	UI	UI	UI	UI	UI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Adult provides tangible item for attending behaviors at the end of the 10 trails										

Summary of Data	
% Unprompted Correct	
% Procedural Fidelity	
% Reliability	

Appendix G: IV1 Modification Intervention Procedural Fidelity and IOA

Data Collection Form

IV1 Modified Intervention Sessions for P.C
Procedural Fidelity and IOA

Child: __________ **Date:** _______ **Session #:**_____ **Instructor:** ____________ **Setting:** ______________

Time of Start of Session:_____ **Time at End of Session:** ______

Target Behavior (circle one): Eat **Data Collector:** ________________________

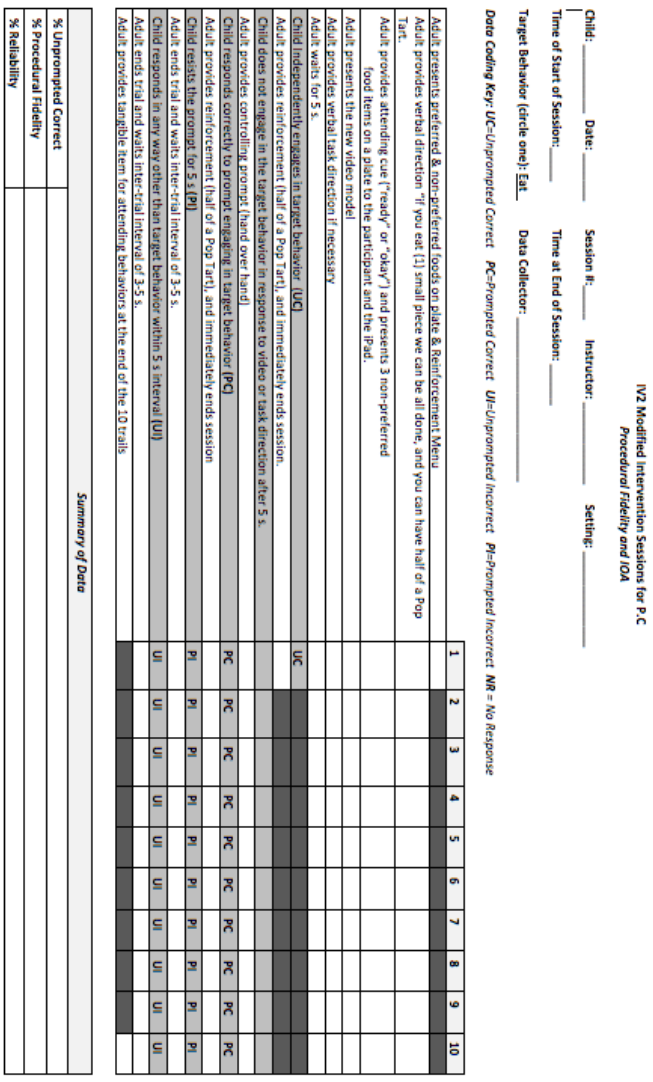
Data Coding Key: UC*=Unprompted Correct* ***PC****=Prompted Correct* ***UI****=Unprompted Incorrect* ***PI****=Prompted Incorrect* ***NR*** *= No Response*

	1	2	3	4	5	6	7	8	9	10
Adult presents preferred & non-preferred foods on plate & Reinforcement Menu										
Adult provides verbal direction "if you eat (1) small piece we can be all done, and you can have half of a Pop Tart.										
Adult provides attending cue ("ready" or "okay") and presents 3 non-preferred food items on a plate to the participant and the iPad.							/			
Adult presents the video model										
Adult provides verbal task direction if necessary										
Adult waits for 5 s.										
Child Independently engages in target behavior **(UC)**	UC									
Adult provides reinforcement (half of a Pop Tart), and immediately ends session.										
Child does not engage in the target behavior in response to video or task direction after 5 s.										
Adult provides controlling prompt (hand over hand)										
Child responds correctly to prompt engaging in target behavior **(PC)**	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC
Adult provides reinforcement (half of a Pop Tart), and immediately ends session										
Child resists the prompt for 5 s **(PI)**	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Child responds in any way other than target behavior within 5 s interval **(UI)**	UI	UI	UI	UI	UI	UI	UI	UI	UI	UI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Adult provides tangible item for attending behaviors at the end of the 10 trails										

Summary of Data	
% Unprompted Correct	
% Procedural Fidelity	
% Reliability	

Appendix H: IV2 Modification Intervention Procedural Fidelity and IOA

Data Collection Form



IV2 Modified Intervention Sessions for P.C
Procedural Fidelity and IOA

Child: _____ **Date:** _____ **Session #:** ____ **Instructor:** _____ **Setting:** _____

Time of Start of Session: ____ **Time at End of Session:** ____

Target Behavior (circle one): Eat

Data Collector: _____

Data Coding Key: *UC=Unprompted Correct* *PC=Prompted Correct* *UI=Unprompted Incorrect* *PI=Prompted Incorrect* *NR = No Response*

	1	2	3	4	5	6	7	8	9	10
Adult presents preferred & non-preferred foods on plate & Reinforcement Menu										
Adult provides verbal direction "If you eat [1] small piece we can be all done, and you can have half of a Pop Tart.										
Adult provides attending cue ("ready" or "okay") and presents 3 non-preferred food items on a plate to the participant and the iPad.										
Adult presents the new video model										
Adult provides verbal task direction if necessary										
Adult waits for 5 s.										
Child independently engages in target behavior (UC)	UC									
Adult provides reinforcement (half of a Pop Tart), and immediately ends session.										
Child does not engage in the target behavior in response to video or task direction after 5 s.										
Adult provides controlling prompt (hand over hand)										
Child responds correctly to prompt engaging in target behavior (PC)	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC
Adult provides reinforcement (half of a Pop Tart), and immediately ends session										
Child resists the prompt, for 5 s (PI)	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Child responds in any way other than target behavior within 5 s interval (UI)	UI	UI	UI	UI	UI	UI	UI	UI	UI	UI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Adult provides tangible item for attending behaviors at the end of the 10 trails										

Summary of Data	
% Unprompted Correct	
% Procedural Fidelity	
% Reliability	

Appendix I: IV3 Modification Intervention Procedural Fidelity and IOA

Data Collection Form

IV3 Modified Intervention Sessions for P.C

Procedural Fidelity and IOA

Child: __________ **Date:** _______ **Session #:**_____ **Instructor:** ____________ **Setting:** ______________

Time of Start of Session:_____ **Time at End of Session:** ______

Target Behavior (circle one): Eat **Data Collector:** ________________________

Data Coding Key: UC*=Unprompted Correct* ***PC****=Prompted Correct* ***UI****=Unprompted Incorrect* ***PI****=Prompted Incorrect* ***NR*** *= No Response*

	1	2	3	4	5	6	7	8	9	10
Adult presents preferred & non-preferred foods on plate & Reinforcement Menu										
Adult provides verbal direction "if you eat (1) small piece we can be all done, and you can have half of a Pop Tart, ice cream, and a hot wheel car.										
Adult provides attending cue ("ready" or "okay") and presents 3 non-preferred food items on a plate to the participant and the iPad.										
Adult presents the new video model										
Adult provides verbal task direction if necessary										
Adult waits for 5 s.										
Child Independently engages in target behavior **(UC)**	**UC**									
Adult provides reinforcement (half of a Pop Tart), and immediately ends session.										
Child does not engage in the target behavior in response to video or task direction after 5 s.										
Adult provides controlling prompt (hand over hand)										
Child responds correctly to prompt engaging in target behavior **(PC)**	**PC**	**PC**	**PC**	**PC**	**PC**	**PC**	**PC**	**PC**	**PC**	**PC**
Adult provides reinforcement (half of a Pop Tart), and immediately ends session										
Child resists the prompt for 5 s **(PI)**	**PI**	**PI**	**PI**	**PI**	**PI**	**PI**	**PI**	**PI**	**PI**	**PI**
Adult ends trial and waits inter-trial interval of 3-5 s.										
Child responds in any way other than target behavior within 5 s interval **(UI)**	**UI**	**UI**	**UI**	**UI**	**UI**	**UI**	**UI**	**UI**	**UI**	**UI**
Adult ends trial and waits inter-trial interval of 3-5 s.										
Adult provides tangible item for attending behaviors at the end of the 10 trails										

Summary of Data	
% Unprompted Correct	
% Procedural Fidelity	
% Reliability	

Appendix J: IV4 Modification Intervention Procedural Fidelity and IOA

Data Collection Form

IV4 Modified Intervention Sessions for P.C
Procedural Fidelity and IOA

Child: __________ **Date:** _______ **Session #:**_____ **Instructor:** ____________ **Setting:** ______________

Time of Start of Session:_____ **Time at End of Session:** ______

Target Behavior (circle one): Eat **Number of Bites to be consumed (circle one):** 1 2 3 **Data Collector:** ________________________

Data Coding Key: UC*=Unprompted Correct* ***PC****=Prompted Correct* ***UI****=Unprompted Incorrect* ***PI****=Prompted Incorrect* ***NR*** *= No Response*

	1	2	3	4	5	6	7	8	9	10
Adult waits to begin session until other students are out of the classroom										
Adult presents preferred & non-preferred foods on plate & Reinforcement Menu										
Adult provides verbal direction "if you eat (1,2,3) small bite(s) we can be all done, and you can have half of a Pop Tart, ice cream, and a hot wheel car.										
Adult provides attending cue ("ready" or "okay") and presents 3 non-preferred food items on a plate to the participant and the iPad.										
Adult presents the new video model										
Adult provides verbal task direction if necessary										
Adult waits for 5 s.										
Child Independently engages in target behavior **(UC)**	UC									
Adult provides reinforcement (half of a Pop Tart), and immediately ends session.										
Child does not engage in the target behavior in response to video or task direction after 5 s.										
Adult provides controlling prompt (hand over hand)										
Child responds correctly to prompt engaging in target behavior **(PC)**	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC
Adult provides reinforcement (half of a Pop Tart), and immediately ends session										
Child resists the prompt for 5 s **(PI)**	PI	PI	PI	PI	PI	PI	PI	PI	PI	PI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Child responds in any way other than target behavior within 5 s interval **(UI)**	UI	UI	UI	UI	UI	UI	UI	UI	UI	UI
Adult ends trial and waits inter-trial interval of 3-5 s.										
Adult provides tangible item for attending behaviors at the end of the 10 trails										

Summary of Data	
% Unprompted Correct	
% Procedural Fidelity	
% Reliability	

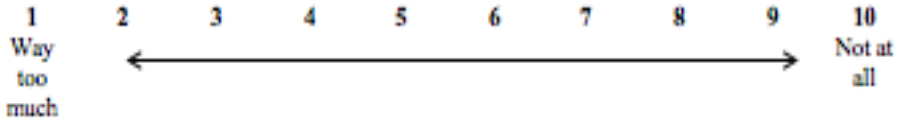
Appendix K: Teacher Social and Ecological Validity Questionnaire

Teacher Social and Ecological Validity Questionnaire

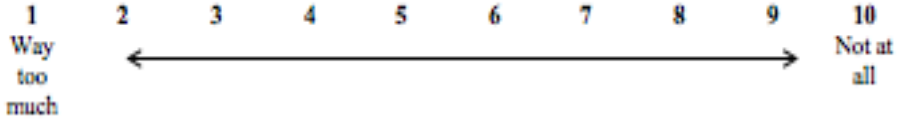
Date Completed: _____

Please answer the following questions with a rating from 1-10.

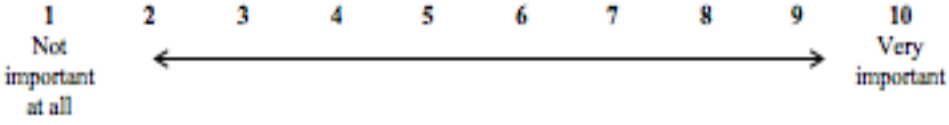
1. *How much did the trainings and teacher feedback interfere with your roles and responsibilities as a teacher?*



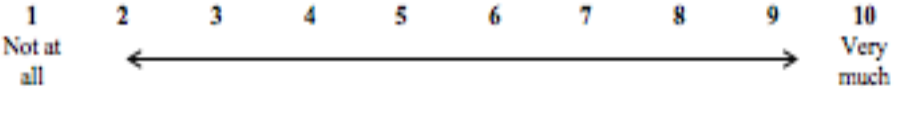
2. *How much did the instructional sessions interfere with your roles and responsibilities as a teacher?*



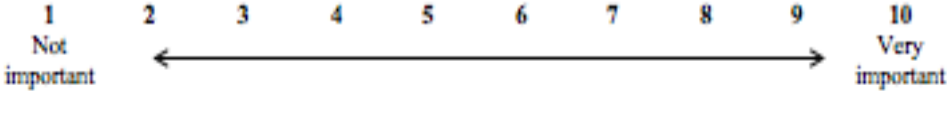
3. *How important do you feel this decreasing food selectivity intervention was for your student?*



4. *How do you think the student enjoyed this intervention?*



5. *How important is it for children to explore and consume a variety of foods in their diet?*



Appendix L: Student Ecological and Social Validity Questionnaire

1. Did you enjoy working with me on touching, smelling, tasting, and eating new foods?

Yes No

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